

Appl. No. 10/814,341
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Reply to Office Action of February 17, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

Claims 1-24 (Cancelled)

25. (Currently Amended) An energy information system which allows an energy information service provider to measure energy usage by a customer at a location, said system comprising:

a sub-measurement board which receives voltage and current signals representative of energy usage at the location, said sub-measurement board outputs a load profile of said energy usage, wherein the sub-measurement board is connected to an energy distribution panel located at the location and receives at least three voltage signals and at least nine current signals from said energy distribution panel, wherein said energy distribution panel includes a display for outputting said energy usage at the location;

a wide area communication network connected directly to the sub-measurement board which transfers the load profile to the energy information service provider;

a processor located at the energy information service provider which processes the load profile; and

wherein said load profile is accessible for remote viewing by the customer.

26. (Previously Presented) The system defined in claim 25 wherein the wide area communications network is one of a radio frequency transmitter/receiver, a communication line or a satellite network.

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27. (Currently Amended) The system defined in claim 25 wherein the sub-measurement board includes a microprocessor which calculates the energy usage of individual circuits of an said energy distribution panel at the location.

28. (Currently Amended) The system defined in claim 25 wherein the sub-measurement board is connected to an utility meter and receives an utility usage signal therefrom, said sub-measurement board ~~outputs~~ outputting cumulative utility usage information.

29. (Previously Presented) The system defined in claim 28 wherein the utility meter is one of an electric meter, water meter or gas meter.

30. (Withdrawn) A sub-measurement board for calculating load data of individual circuits of an energy distribution panel, said sub-measurement board including:

a voltage amplifying circuit connected to a voltage terminal of the energy distribution panel for receiving an input voltage signal, said voltage amplifying circuit amplifies the input voltage signal and outputs an amplified voltage signal;

a current amplifying circuit connected to a current terminal of the energy distribution panel for receiving an input current signal, said current amplifying circuit amplifies the input current signal and outputs an amplified current signal;

a switching circuit connected to the current amplifying circuit for receiving the amplified current signal, said switching circuit outputs a switched amplified current signal;

an analog to digital converter connected to the voltage amplifying circuit and the switching circuit for converting the amplified voltage signal into a digital voltage signal and for converting the switched amplified current signal to a digital current signal;

a memory circuit for storing the digital voltage signal and the digital current signal;

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a microprocessor connected to the memory circuit for receiving the stored digital voltage signal and digital current signal, said microprocessor calculates the load data of individual circuits of the energy distribution panel;

a first memory circuit connected to the microprocessor, said first memory circuit stores computer instructions which are loaded into the microprocessor and which instruct the microprocessor to compare the digital current signal to the digital voltage signal and determine whether the digital current signal and digital voltage signals are input into the sub-measurement board from a common individual circuit of the energy distribution panel; and

a display connected to the microprocessor for displaying the calculated load data of the individual circuits of the energy distribution panel.

31. (Withdrawn) The sub-measurement board defined in Claim 42 wherein the voltage amplifying circuit is connected to a plurality of voltage terminals of the energy distribution panel for receiving a plurality of input voltage signals, said voltage amplifying circuit amplifies the plurality of input voltage signals and outputs a plurality of amplified voltage signals.

32. (Withdrawn) The sub-measurement board defined in Claim 43 wherein the current amplifying circuit is connected to a plurality of current terminals of the energy distribution panel for receiving a plurality of input current signals, said current amplifying circuit amplifies the plurality of input current signals and outputs a plurality of amplified current signals.

33. (Withdrawn) The sub-measurement board defined in Claim 30 further including an isolation circuit for isolating the sub-measurement board from external electric and magnetic fields.

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34. (Withdrawn) A sub-measurement board for calculating load data of individual circuits of an energy distribution panel and transmitting the load data to a communications network, said submeasurement board including:

a voltage amplifying circuit connected to a voltage terminal of the energy distribution panel for receiving an input voltage signal, said voltage amplifying circuit amplifies the input voltage signal and outputs an amplified voltage signal;

a current amplifying circuit connected to a current terminal of the energy distribution panel for receiving an input current signal, said current amplifying circuit amplifies the input current signal and outputs an amplified current signal;

a switching circuit connected to the current amplifying circuit for receiving the amplified current signal, said switching circuit outputs a switched amplified current signal;

an analog-to-digital converter connected to the voltage amplifying circuit and the switching circuit for converting the amplified voltage signal into a digital voltage signal and for converting the switched amplified current signal to a digital current signal;

a memory circuit for storing the digital voltage signal and the digital current signal;

a microprocessor connected to the memory circuit for receiving the stored digital voltage signal and digital current signal, said microprocessor calculates the load data of individual circuits of the energy distribution panel;

a first memory circuit connected to the microprocessor, said first memory circuit stores computer instructions which are loaded into the microprocessor and which instruct the microprocessor to compare the digital current signal to the digital voltage signal and determine

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whether the digital current signal and digital voltage signals are input into the sub-measurement board from a common individual circuit of the energy distribution panel; and

an output device for outputting the calculated load data of the individual circuits of the energy distribution panel to the communications network.

35. (Previously Presented) An energy information system which allows an energy information service provider to measure energy usage by a customer at a location, said system comprising:

a sub-measurement board which receives voltage and current signals representative of energy usage at the location, said sub-measurement board outputs a load profile of said energy usage, wherein the sub-measurement board is connected to an energy distribution panel located at the location and receives at least three voltage signals and at least nine current signals from said energy distribution panel;

a wide area communication network connected directly to the sub-measurement board which transfers the load profile to the energy information service provider;

a platform located at the energy information service provider which hosts software and databases that enable translation of the load profile from at least one communication protocol into a format that is adapted for processing by the energy information service provider; and

wherein said load profile is accessible for remote viewing by the customer.

36. (Previously Presented) The system of claim 35, wherein the at least one communication protocol comprises at least one of a radio frequency signal, a telephone signal, and a satellite signal.

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37. (Currently Amended) An energy utility information system which allows an energy information service provider to measure energy utility usage by a customer at a location, said system comprising:

at least two utility meters, the at least two utilities utility meters comprising two of an electric meter, a water meter, and a gas meter;

a sub-measurement board which receives voltage and current signals from the at least two utility meters representative of energy utility usage at the location, said sub-measurement board outputs a load profile of said energy utility usage, wherein the sub-measurement board is connected to an energy distribution panel located at the location and receives at least three voltage signals and at least nine current signals from said energy distribution panel;

a wide area communication network connected directly to the sub-measurement board which transfers the load profile to the energy information service provider;

a processor located at the energy information service provider which processes the load profile; and

wherein said load profile indicates a cumulative, periodic consumption of a customer's metered utilities.

38. (Currently Amended) A method of monitoring energy utility usage by a customer at a location, said method comprising the steps of:

receiving metered utility data from at least two utility meters, said metered utility data being representative of energy utility usage at the location;

processing the metered utility data; and

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outputting a cumulative, real-time measurement of usage of a customer's metered utilities.

39. (Currently Amended) An energy utility information system enabling an energy information service provider to measure energy utility usage by at least one load of at least one customer at a remote location, said system comprising:

at least two utility meters, the at least two utilities utility meters comprising two of an electric meter, a water meter, and a gas meter measuring the energy utility usage by the at least one customer;

at least one sub-measurement board which receives input signals from at least one of the at least two utility meters representative of energy utility usage by the at least one customer, said at least one sub-measurement board outputs a load profile of said energy utility usage, wherein the at least one sub-measurement board is connected to an energy distribution panel located at the remote location and receives at least three voltage signals and at least nine current signals from said energy distribution panel;

at least one distribution panel connected to the at least one load distributing energy to the at least one load for the energy utility usage;

a wide area communication network responsively connected directly to the at least one sub-measurement board which transfers the load profile to the energy information service provider;

a gateway platform system including software and databases that enable translation of the load profile from a plurality of signal protocols received via said wide area communications

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network from said at least one sub-measurement board into a format that is adapted for processing by the energy information service provider; and

a processor system located at the energy information service provider which processes the load profile.

40. (Currently Amended) An energy utility information system enabling an energy information service provider to measure energy utility usage by at least one customer at a remote location, said system comprising:

at least two utility meters, the at least two ~~utilities~~ utility meters comprising two of an electric meter, a water meter, and a gas meter measuring the energy utility usage by the at least one customer, and outputting input signals from at least one of the at least two utility meters representative of energy utility usage by the at least one customer, and outputting a load profile of said energy utility usage, wherein said load profile of said utility usage is accessible by the at least one customer in real-time;

a wide area communication network responsively connected to said at least two utility meters which transfers the load profile to the energy information service provider;

a gateway platform system including software and databases that enable translation of the load profile from a plurality of signal protocols received via said wide area communications network from said at least two utility meters into a format that is ~~capable of~~ adapted for processing by the energy information service provider; and

a processor system located at the energy information service provider which processes the load profile.

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41. (Currently Amended) An energy utility information system enabling an energy information service provider to measure energy utility usage by at least one load of at least one customer at a remote location, said system comprising:

at least two utility meters, the at least two ~~utilities~~ utility meters comprising two of an electric meter, a water meter, and a gas meter measuring the energy utility usage by the at least one customer;

at least one sub-measurement board which receives input signals from at least one of the at least two utility meters representative of energy utility usage by the at least one customer, said at least one sub-measurement board outputs a load profile of said energy utility usage, wherein the at least one sub-measurement board is connected to an energy distribution panel located at the remote location and receives at least three voltage signals and at least nine current signals from said energy distribution panel;

at least one distribution panel connected to the at least one load distributing energy to the at least one load for the energy utility usage;

a wide area communication network responsively connected directly to the at least one sub-measurement board which transfers the load profile to the energy information service provider; and

a processor system located at the energy information service provider which processes the load profile.

42. (Previously Presented) The system of claim 25, wherein the sub-measurement board is adapted to separately measuring a plurality of loads.

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43. (Withdrawn) The sub-measurement board of claim 30, wherein the sub-measurement board is adapted to separately measuring a plurality of loads.
44. (Withdrawn) The sub-measurement board of claim 34, wherein the sub-measurement board is adapted to separately measuring a plurality of loads.
45. (Currently Amended) An energy information system which allows an energy information service provider to measure energy usage by a customer at a location, said system comprising:
- a sub-measurement board which receives voltage and current signals representative of energy usage at the location, said sub-measurement board outputs a load profile of said energy usage, wherein the sub-measurement board further includes means for receiving at least three voltage signals and at least nine current signals from said an energy distribution panel;
 - a wide area communication network connected directly to the sub-measurement board which transfers the load profile to the energy information service provider;
 - a processor located at the energy information service provider which processes the load profile; and
- wherein said load profile is accessible for remote viewing by the customer.
46. (Withdrawn) A sub-measurement board for calculating load data of individual circuits of an energy distribution panel, said sub-measurement board including:
- a voltage amplifying circuit connected to a voltage terminal of the energy distribution panel for receiving an input voltage signal, said voltage amplifying circuit amplifies the input voltage signal and outputs an amplified voltage signal;

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a current amplifying circuit connected to a current terminal of the energy distribution panel for receiving an input current signal, said current amplifying circuit amplifies the input current signal and outputs an amplified current signal;

a switching circuit connected to the current amplifying circuit for receiving the amplified current signal, said switching circuit outputs a switched amplified current signal;

an analog to digital converter connected to the voltage amplifying circuit and the switching circuit for converting the amplified voltage signal into a digital voltage signal and for converting the switched amplified current signal to a digital current signal;

a memory circuit for storing the digital voltage signal and the digital current signal;

a microprocessor connected to the memory circuit for receiving the stored digital voltage signal and digital current signal, said microprocessor calculates the load data of individual circuits of the energy distribution panel;

first memory means for storing computer instructions which are loaded into the microprocessor and which instruct the microprocessor to compare the digital current signal to the digital voltage signal and determine whether the digital current signal and digital voltage signals are input into the sub-measurement board from a common individual circuit of the energy distribution panel; and

a display connected to the microprocessor for displaying the calculated load data of the individual circuits of the energy distribution panel.

47. (Withdrawn) A sub-measurement board for calculating load data of individual circuits of an energy distribution panel and transmitting the load data to a communications network, said submeasurement board including:

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a voltage amplifying circuit connected to a voltage terminal of the energy distribution panel for receiving an input voltage signal, said voltage amplifying circuit amplifies the input voltage signal and outputs an amplified voltage signal;

a current amplifying circuit connected to a current terminal of the energy distribution panel for receiving an input current signal, said current amplifying circuit amplifies the input current signal and outputs an amplified current signal;

a switching circuit connected to the current amplifying circuit for receiving the amplified current signal, said switching circuit outputs a switched amplified current signal;

an analog-to-digital converter connected to the voltage amplifying circuit and the switching circuit for converting the amplified voltage signal into a digital voltage signal and for converting the switched amplified current signal to a digital current signal;

a memory circuit for storing the digital voltage signal and the digital current signal;

a microprocessor connected to the memory circuit for receiving the stored digital voltage signal and digital current signal, said microprocessor calculates the load data of individual circuits of the energy distribution panel;

first memory means for storing computer instructions which are loaded into the microprocessor and which instruct the microprocessor to compare the digital current signal to the digital voltage signal and determine whether the digital current signal and digital voltage signals are input into the sub-measurement board from a common individual circuit of the energy distribution panel; and

an output device for outputting the calculated load data of the individual circuits of the energy distribution panel to the communications network.

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48. (Currently Amended) An energy information system which allows an energy information service provider to measure energy usage by a customer at a location, said system comprising:

a sub-measurement board which receives voltage and current signals representative of energy usage at the location, said sub-measurement board outputs a load profile of said energy usage, wherein the sub-measurement board further includes means for receiving at least three voltage signals and at least nine current signals from ~~said~~ an energy distribution panel;

a wide area communication network connected directly to the sub-measurement board which transfers the load profile to the energy information service provider;

a platform located at the energy information service provider which hosts software and databases that enable translation of the load profile from at least one communication protocol into a format that is adapted for processing by the energy information service provider; and

wherein said load profile is accessible for remote viewing by the customer.

49. (Currently Amended) An energy utility information system which allows an energy information service provider to measure energy utility usage by a customer at a location, said system comprising:

at least two utility meters, the at least two utility meters comprising two of an electric meter, a water meter, and a gas meter;

a sub-measurement board which receives voltage and current signals from the at least two utility meters representative of energy utility usage at the location, said sub-measurement board outputs a load profile of said energy utility usage, wherein the sub-measurement board further includes means for receiving at least three voltage signals and at least nine current signals from ~~said~~ an energy distribution panel;

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a wide area communication network connected directly to the sub-measurement board which transfers the load profile to the energy information service provider;

a processor located at the energy information service provider which processes the load profile; and

wherein said load profile indicates a cumulative, periodic consumption of a customer's metered utilities.

50. (Currently Amended) An energy utility information system enabling an energy information service provider to measure energy utility usage by at least one load of at least one customer at a remote location, said system comprising:

at least two utility meters, the at least two utilities utility meters comprising two of an electric meter, a water meter, and a gas meter measuring the energy utility usage by the at least one customer;

at least one sub-measurement board which receives input signals from at least one of the at least two utility meters representative of energy utility usage by the at least one customer, said at least one sub-measurement board outputs a load profile of said energy utility usage, wherein the at least one sub-measurement board further includes means for receiving at least three voltage signals and at least nine current signals from said an energy distribution panel;

at least one distribution panel connected to the at least one load distributing energy to the at least one load for the energy utility usage;

a wide area communication network responsively connected to the at least one sub-measurement board which transfers the load profile to the energy information service provider;

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a gateway platform system including software and databases that enable translation of the load profile from a plurality of signal protocols received via said wide area communications network from said at least one sub-measurement board into a format that is adapted for processing by the energy information service provider; and

a processor located at the energy information service provider which processes the load profile.

51. (Currently Amended) An energy utility information system enabling an energy information service provider to measure energy utility usage by at least one load of at least one customer at a remote location, said system comprising:

at least two utility meters, the at least two ~~utilities~~ utility meters comprising two of an electric meter, a water meter, and a gas meter measuring the energy utility usage by the at least one customer;

at least one sub-measurement board which receives input signals from at least one of the at least two utility meters representative of energy utility usage by the at least one customer, said at least one sub-measurement board outputs a load profile of said energy utility usage, wherein the at least one sub-measurement board further includes means for receiving at least three voltage signals and at least nine current signals from said an energy distribution panel;

at least one distribution panel connected to the at least one load distributing energy to the at least one load for the energy utility usage;

a wide area communication network responsively connected to the at least one sub-measurement board which transfers the load profile to the energy information service provider;
and

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a processor located at the energy information service provider which processes the load profile.